

## What Comes Before the Standard Algorithm?

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### 1<sup>st</sup> Grade

6. Add and subtract within 20, demonstrating fluency for addition and subtraction within 10. Use strategies such as counting on; making ten (e.g.,  $8 + 6 = 8 + 2 + 4 = 10 + 4 = 14$ ); decomposing a number leading to a ten (e.g.,  $13 - 4 = 13 - 3 - 1 = 10 - 1 = 9$ ); using the relationship between addition and subtraction (e.g., knowing that  $8 + 4 = 12$ , one knows  $12 - 8 = 4$ ); and creating equivalent but easier or known sums (e.g., adding  $6 + 7$  by creating the known equivalent  $6 + 6 + 1 = 12 + 1 = 13$ ).

### 2<sup>nd</sup> Grade

5. Fluently add and subtract within 100 using strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.
7. Add and subtract within 1000, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method. Understand that in adding or subtracting three-digit numbers, one adds or subtracts hundreds and hundreds, tens and tens, ones and ones; and sometimes it is necessary to compose or decompose tens or hundreds.

### 3<sup>rd</sup> Grade

2. Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.

### 4<sup>th</sup> Grade

4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Additive Identity Property  
 $(a + 0 = a)$

$$\begin{array}{r} 43 \\ + 28 \\ \hline \end{array} \quad \begin{array}{r} -2 \\ +2 \\ \hline \end{array} = \begin{array}{r} 41 \\ +30 \\ \hline 71 \end{array}$$

Associative Property  
 $(a + b) + c = a + (b + c)$

$$\begin{array}{r} 43 + 28 \\ \wedge \\ 41 + 2 + 28 \\ \wedge \\ 41 + 30 \\ \wedge \\ 71 \end{array}$$

Place Value  
 (expanded)

$$\begin{array}{r} 43 \\ + 28 \\ \hline \end{array} = \begin{array}{r} 40 + 3 \\ + 20 + 8 \\ \hline 60 + 11 = 71 \end{array}$$

Place Value  
 (partial sums)

$$\begin{array}{r} 43 \\ + 28 \\ \hline 60 \\ 11 \\ \hline 71 \end{array} \quad \begin{array}{r} 43 \\ + 28 \\ \hline 11 \\ 60 \\ \hline 71 \end{array}$$

Place Value  
 (compact)

$$\begin{array}{r} 43 \\ + 28 \\ \hline 71 \end{array}$$

Standard  
 Algorithm

$$\begin{array}{r} 43 \\ + 28 \\ \hline 71 \end{array}$$

Caleb rode the tram \_\_\_\_\_ meters up the mountain and then hiked up \_\_\_\_\_ more meters.  
How far will he need to hike to get back down to the tram station?

(28, 43)    (218, 453)    (218, 493)

1. Solve (28, 43) using a model or diagram	2. Solve (28, 43) using properties of operations
3. Solve (28, 43) using place value	4. Solve (28, 43) using an "alternative" algorithm

#### Norms for Sharing

- Listen to people sharing their thinking
- Learn from other people's thinking
- Understand/Ask questions to help you understand
- Give respect to person talking
- Look at the person who is talking -- pay attention



